Chapter 4: Head, Complements, and Modifiers

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Internal syntax

- **Internal syntax** deals with how a given phrase itself is constructed in a well-formed manner.
- Data

(1) a. *John [put his gold].
b. *John [put under the bathtub].
c. *John [put his gold safe].
d. *John [put his gold to be under the bathtub].
e. John [put his gold under the bathtub].

External syntax

- concerned with the external environment in which a phrase occurs
- data

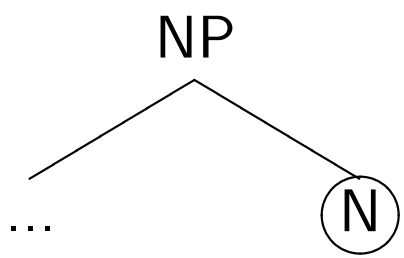
(2) a. This is the box in which John [put his gold]. (cf. (1a))
b. This is the gold that John [put under the bathtub]. (cf. (1b))

(3) a. *The king kept [put his gold under the bathtub].
b. The king kept [putting his gold under the bathtub].

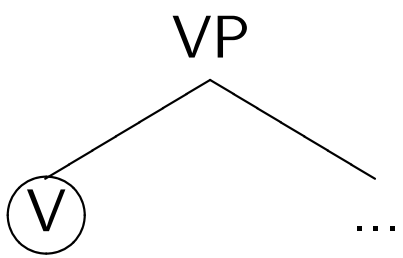
Head

- one obligatory element in each phrase. That is, each phrase has one essential element as represented in the diagrams

(4) a.



b.



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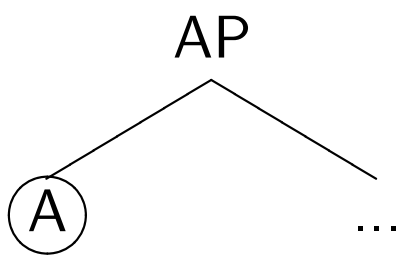


headedness and complements

- deciding the types of complements

(5) a. The defendant denied the accusation.
b. *The defendant denied.

(6) a. The teacher handed the student a book.
b. *The teacher handed the student.

- deciding the properties of the whole phrase

(7) a. They [want to leave the meeting].
b. *They [eager to leave the meeting].

(8) a. The senators [know that the president is telling a lie].
b. *The senators [certain that the president is telling a lie].

Basic rule

- Basic rule

  (9) English Declarative Sentence Rule:
  Each declarative sentence must contain a finite VP.

- data

(10) a. *They [(to) be eager to leave the meeting].
b. *The senators [(to) be certain that the president is telling a lie].

modifiers

- data

(11) a. Tom [$_{VP}$ [$_{VP}$ offered advice to his students] *in his office*].
b. Tom [$_{VP}$ [$_{VP}$ offered advice to his students] *with love*].

Summary

(12) a. **Head**: A lexical or phrasal element that is essential in forming a phrase.

b. **Complement**: A phrasal element that a head must combine with or a head select. These include direct object, indirect object, predicative complement, and oblique complement.

c. **Modifier**: A phrasal element not selected by the verb functions as a modifier to the head phrase.

d. **Minimal Phrase**: A minimal phrase is the phrase including this head and all of its complements.

e. **Maximal Phrase**: A XP (VP/NP/AP) that includes complements as well as modifiers.

Obligatoriness

- complements are strictly-required phrases whereas modifiers are not.

(13) a. John placed Kim behind the garage.
b. John kept him behind the garage.
c. *John stayed Kim behind the garage.

(14) a. *John placed him busy.
b. John kept him busy.
c. *John stayed him busy.

(15) a. *John placed behind the counter.
b. *John kept behind the counter.
c. John stayed behind the counter.

- modifiers are optional.

(16) a. John deposited some money in the bank.
b. John deposited some money in the bank on Friday.

Iterability

- In general two or more instances of the same modifier type can occur with the same head, but this is impossible for complements.

(17) a. *The UN blamed global warming [on humans] [on natural causes].

b. Kim and Sandy met [in Seoul] [in the lobby of the Lotte Hotel] in March.

do-so test

- We can use *do the same thing* to avoid repetition of an identical VP expression:

(18) a. John deposited some money in the checking account and Mary did the same thing (too).

b. John deposited some money in the checking account on Friday and Mary did the same thing (too).

- this VP can replace only the minimal phrase, leaving out the modifier.

(19) John deposited some money in the checking account on Friday and Mary did the same thing on Monday.

do-so test

- if something can be replaced by *do the same thing*, then it is either a minimal or a maximal phrase. This in turn means that this 'replacement' VP cannot be understood to leave out any complement(s).

(20) a. *John [deposited some money in the checking account] and Mary did the same thing in the savings account.

b. *John [gave a present to the student] and Mary did the same thing to the teacher.

[in the above examples 'in the checking account' and 'to the student' are complements of the verb, hence these must be part of the 'do/did the same thing'. And since these aren't in the above cases, this makes them ungrammatical]

do-so replacement rule

- Rule

(21) *Do-so* Replacement Condition:
The phrase *do so* or *do the same thing* can replace a verb phrase which includes at least any complements of the verb.

(22) a. *John locked Fido in the garage and Mary did so in the room.

b. *John ate a carrot and Mary did so a radish.

constance of semantic contribution

another word
for a modifier

- An adjunct can cooccur with a relatively broad range of heads whereas a complement is typically limited in its distribution.

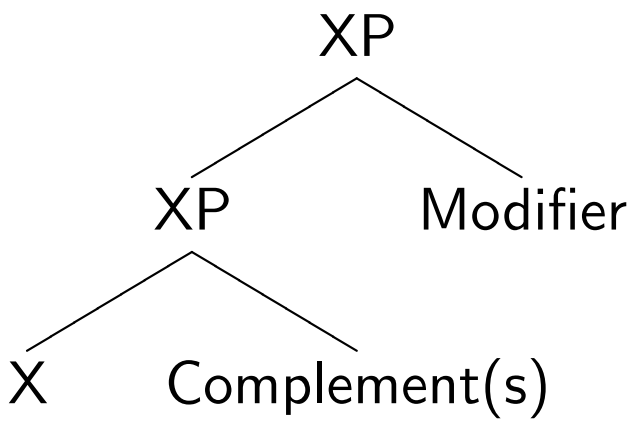
(23) a. Kim camps/jogs/mediates on the hill.
b. Kim jogs on the hill/under the hill/over the hill.

(24) a. Kim depends/relies on Sandy.
b. Kim depends on Sandy/*at Sandy/*for Sandy.

structural difference

- complements combine with a lexical head (not a phrase) to form a minimal phrase whereas modifiers combine with a phrase to form a maximal phrase.

(25)

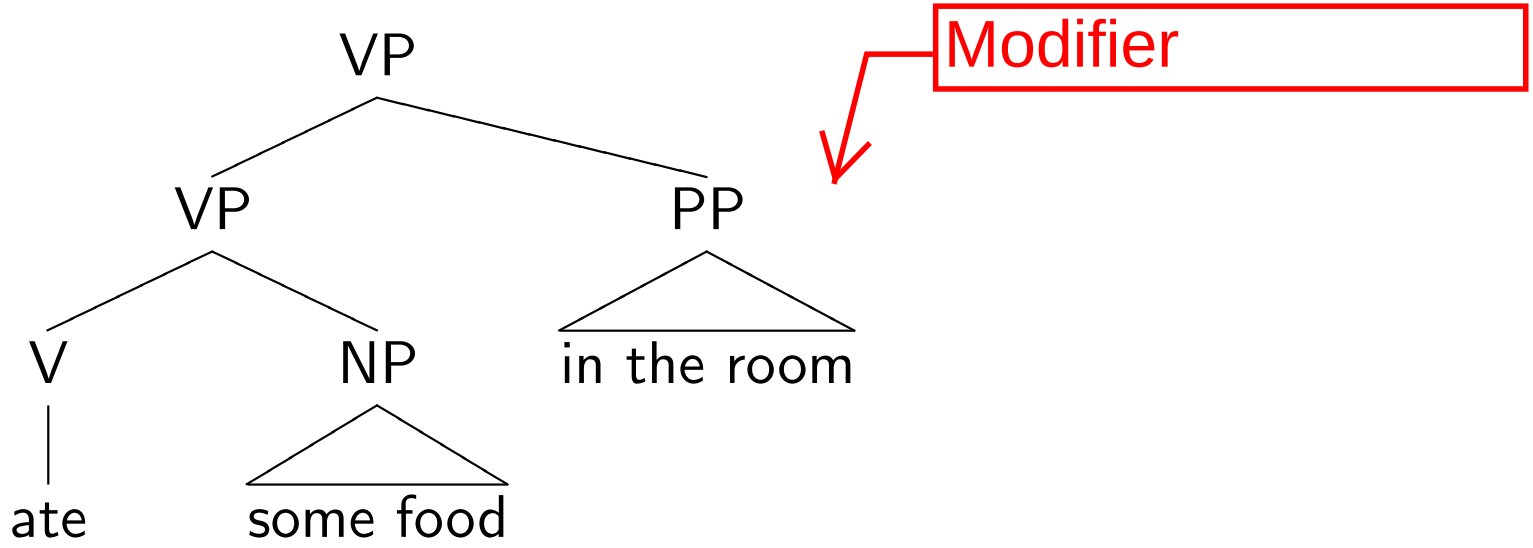


See slide 10. it is possible to have a sentence with multiple modifiers where at least on them works as a complement.

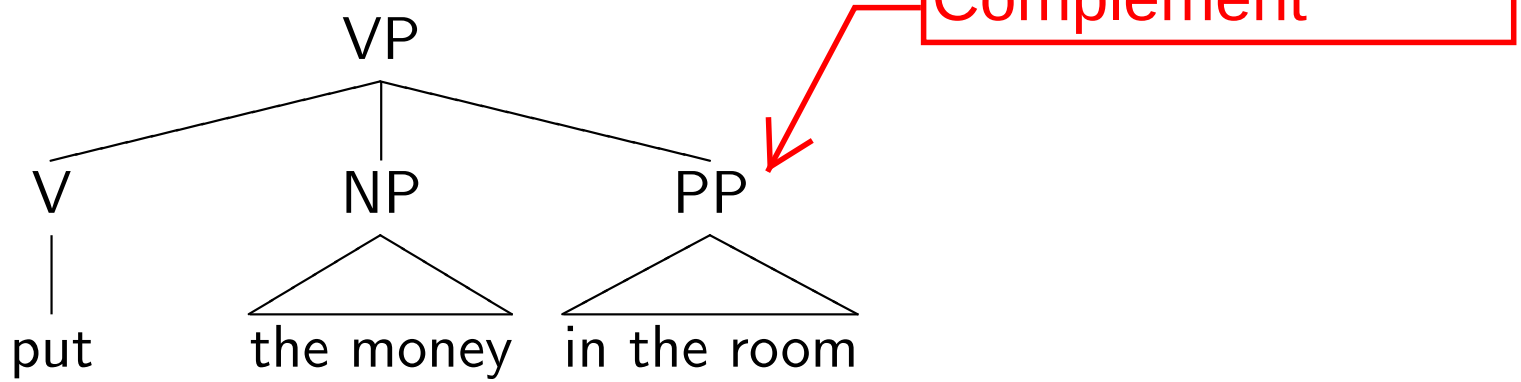
17 b. Kim and Sandy met [in Seoul] [in the lobby of the Lotte Hotel] in March.

structural contrast

(26) a.



b.



ordering difference

- As a complement needs to combine with a lexical head first, modifiers follow complements:

(27) a. John met [a student] [in the park].
b. *John met [in the park] [a student].

A similar contrast can be observed in the following contrast:

(28) a. the student [of linguistics] [with long hair]
b. *the student [with long hair] [of linguistics]

How about

17 b: Kim and Sandy met [in Seoul] [in the lobby of the Lotte Hotel] in March.

PS rules

(29)
a. S → NP VP
b. NP → Det AdjP* N
c. VP → V (NP) (VP)
d. VP → V NP AP
e. VP → V NP NP
f. VP → V S
g. AP → A VP
h. PP → P NP
i. VP → Adv VP

We have seen in Chapter 2 that PS rules can describe how English sentences are formed. However, two main issues arise with the content of PS rules. The first is related to the HEADEDNESS of each phrase, often called the 'ENDOCENTRICITY' property of each phrase.

Two problems

- endocentricity

(30) a. VP → P NP
b. NP → PP S

if we allow such 'non-endocentric' PS rules in which a phrase does not have a lexical head, the grammar would then be too powerful to generate only the grammatical sentences of the language.

- redundancy

(31) a. *The problem disappeared the accusation.
b. The problem disappeared.

(32) a. *The defendant denied.
b. The defendant denied the accusation.

(33) a. *The boy gave the book.
b. The boy gave the baby the book.

more on the redundancy

(34) a. disappear: IV, __

b. deny: TV, __ NP

c. give: DTV, __ NP NP

(35) a. VP → IV

b. VP → TV NP

c. VP → DTV NP NP

The different patterns of complementation are said to define different subcategories of the type verb. The specific pattern of complements is known as the 'subcategorization' requirement of each verb, which can be represented as following
IV: intransitive,
TV: transitive,
DTV: ditransitive):

Taking these all together, we see that a grammar of the type just suggested must redundantly encode the subcategorization information both in the lexical type of each verb (e.g., DTV) and in the PS rule for that type of verb.

more on redundancy

- A similar issue of redundancy arises in accounting for subject-verb agreement:

(36) a. The bird devours the worm.
b. The birds devour the worm.

(37) a. $S \rightarrow NP_{singular}\ VP_{singular}$ (for (36)a)
b. $S \rightarrow NP_{plural}\ VP_{plural}$ (for (36)b)

Descriptively, there is no problem with a grammar with many specific parts. From a theoretical perspective, though, we have a concern about the the endocentricity and redundancy issues. A more related question is that of how many PS rules English has. For example, how many PS rules do we need to characterize English VPs?—Presumably there are as many rules as there are subcategories of verb.

intermediate category

Side Note: We need to investigate the abstract content of PS rules, in order to develop a theoretical view of them. For example, it seems to be the case that each PS rule must have a 'head'.

- intermediate category

(38) a. Every photo of Max and sketch by his students appeared in the magazine.

b. No photo of Max and sketch by his students appeared in the magazine.

(39) *Sketch by his students appeared in the magazine.

(40) a. Every [[photo of Max] and [sketch by his students]] appeared in the magazine.

b. No [[photo of Max] and [sketch by his students]] appeared in the magazine.

The expression 'photo of Max' and 'sketch by his students' are phrasal elements but not full NPs — so what are they? We call these 'intermediate phrases', notationally represented as N-bar or N'. The phrase N' is thus intuitively bigger than a noun, but smaller than a full NP, in the sense that it still requires a determiner from the class the, every, no, some, and the like.

specifier

The phrase "the enemy's" in (41a) and the subject "the enemy" in (41b) are semantically similar in the sense that they complete the specification of the event denoted by the predicate. These phrases are treated as the specifiers of N' and of VP, respectively.

- The complementary notion that we introduce at this point is 'specifier' (SPR), which can include the words just mentioned as well as phrases, as we illustrate in (41):

(41) a. [the enemy's] [$_{N'}$ destruction of the city]
b. [The enemy] [$_{VP}$ destroyed the city].

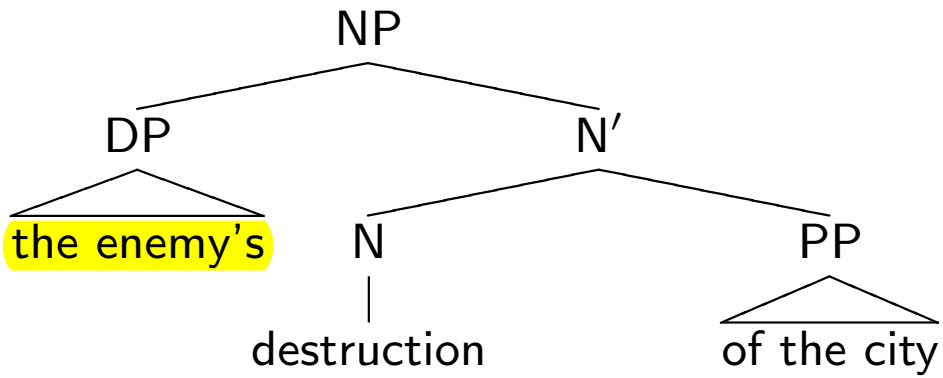
(42) a. *a* little dog, *the* little dogs (indefinite or definite article)
b. *this* little dog, *those* little dogs (demonstrative)
c. *my* little dogs, *their* little dog (possessive adjective)
d. *every* little dog, *each* little dog, *some* little dog, *either* dog, *no* dog (quantifying)
e. *my friend's* little dog, *the Queen of England's* little dog (possessive phrase)

The italicized expressions here all function as the specifier of N'. However, notice that though most of these specifiers are determiners, some consist of several words as in (42e) (my friend's, the Queen of England's) .

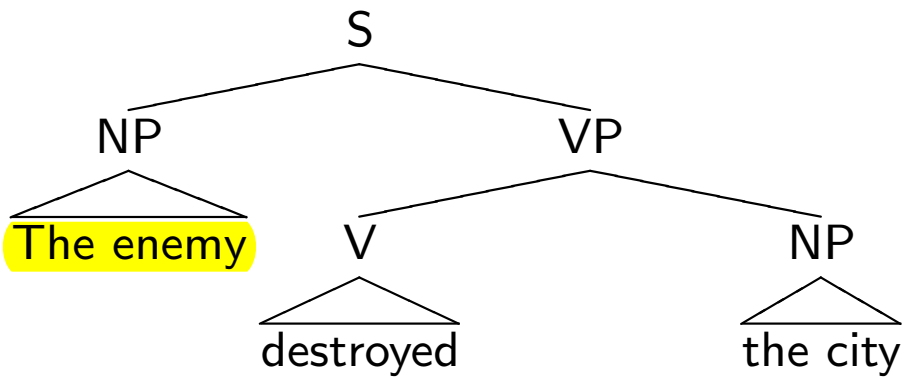
NP vs. S

This motivates us to introduce the new phrase type DP (determiner phrase) that includes the possessive phrase (NP + 's) as well as determiners. This new phrase then will give us the generalization that the specifier of N' is a DP

(43)



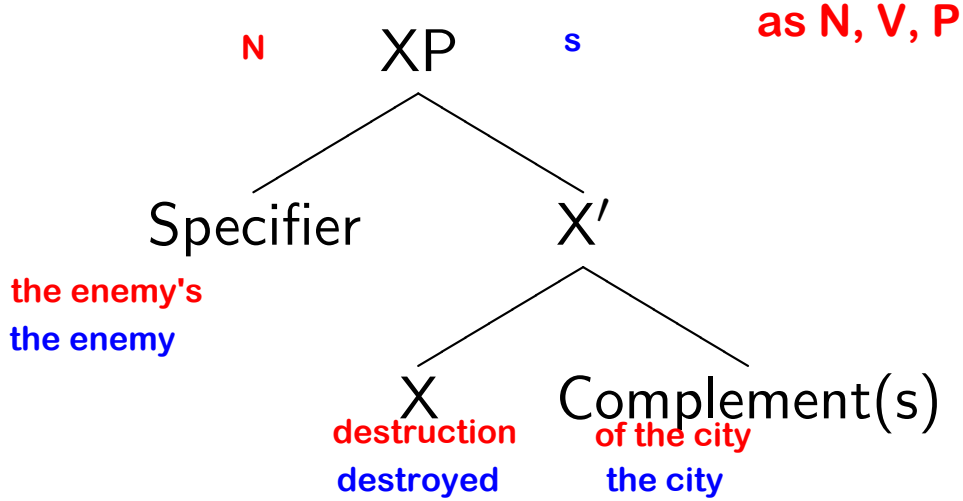
(44)



Even though the NP and S are different phrases, we can notice several similarities. In the NP structure, the head N "destruction" combines with its complement and forms an intermediate phrase N' which in turn combines with the specifier DP "the enemy's". In the S structure, the head V combines with its complement "the city" and forms a VP. This resulting VP then combines with the subject "the enemy", which is also a specifier. In a sense, the VP is an intermediate phrase that requires a subject in order to be a full and complete S.

X′ Schema

(45)



(46) a. XP → Specifier, X′ (Head-Specifier Rule)

b. XP → X, YP* (Head-Complement Rule)

(47) XP → Modifier, X′ (Head-Modifier Rule)

Given these similarities between NP and S structures, we can generalize over them as in (45), where X is a variable over categories such as N, V, P, and other grammatical categories

X' is a kind of an immediate phrase that requires a specifier (like a VP requires a specifier NP.
Within a VP (which is a X'), there's a 'head', plus it's complements. This should explain 46a.

An XP can also consist of a 'head' and it's complements (46b)
An Xp can also consist of a X' plus some modifier(s)
(, indicates that order is not relevant here.)

46 a&b (These Head-Specifier and Head-Complement Rules) which form the central part of 'X'-theory', account for the core structure of NP as well as that of S.
In addition to these two, we just need one more rule 47 (Head-Modifier Rule allows a modifier to combine with its head as in the PS rule VP --> VP Adv/PP

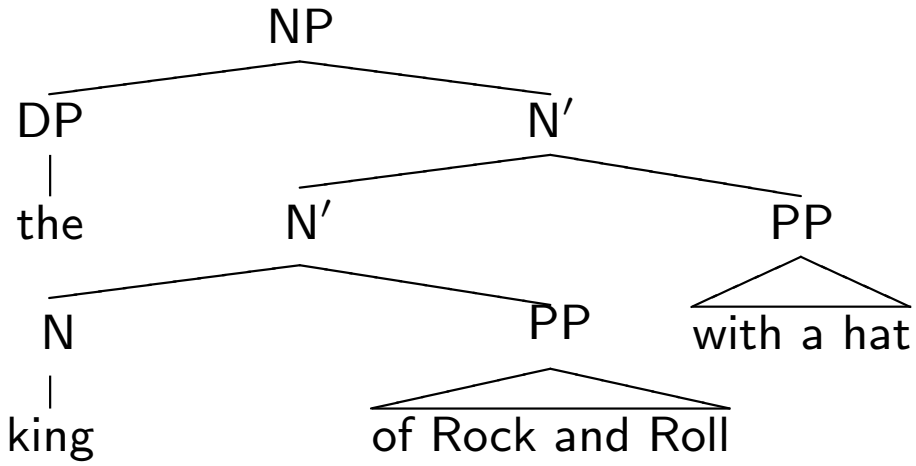
NP structure

One thing to notice in the Head-Complement Rule is that the head must be a lexical element. This in turn means that we cannot apply the Head-Modifier Rule first and then the Head-Complement Rule. This explains the following contrast:

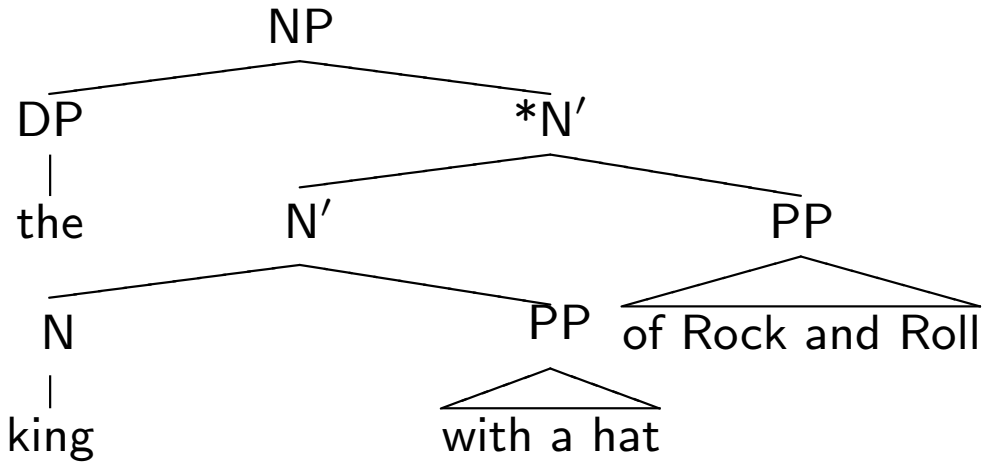
(48) a. the king [of Rock and Roll] [with a hat]

b. *the king [with a hat] [of Rock and Roll]

(49) a.



b.



support for N′

There are several more welcome consequences that the three X' rules that bring to us. The grammar rules can account for the same structures as all the PS rules we have seen so far: with those rules we can identify phrases whose daughters are a head and its complement(s), or a head and its specifier, or a head and its modifier. The three X' rules thereby greatly minimize the number of PS rules that need to characterize well-formed English sentences.

(50) a. The present king of country music is more popular than the last *one*.

'one' replaces the N' (king of country music), and not entire NP with specifier and N'

b. *The king of Rock and Roll is more popular than the *one* of country music.

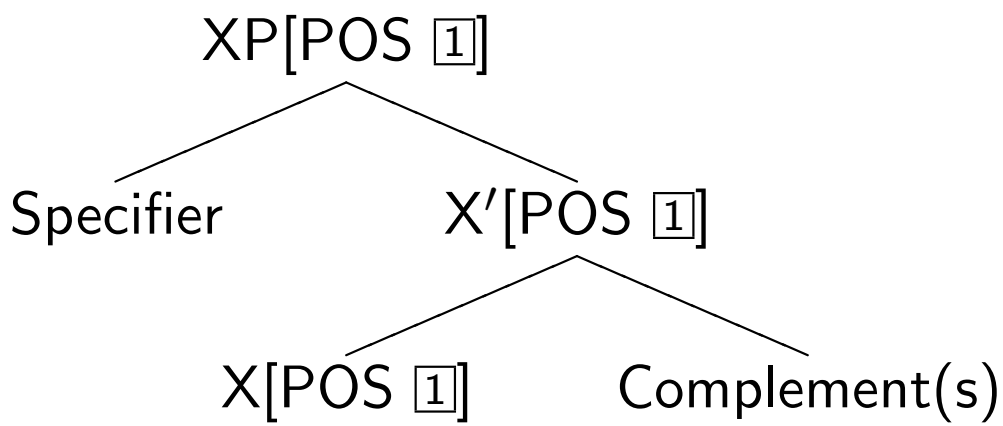
(51) A: Which student were you talking about?

B: The one with long hair.

B: *The one of linguistics with long hair.

X′ Schema with a feature

(52)



(53) XP → Specifier[NUMBER 1], X′[NUMBER 1]

So (52) indicates that the phrase's POS value is identical to its head daughter, capturing the headedness of each phrase: the grammar just does not allow any phrase without a head. The redundancy issue mentioned above for agreement is now a matter of introducing another feature, NUMBER. That is, with the new feature NUMBER, with values singular and plural, we can add a detail to the Head-Specifier Rule as in (54)
The rule states that the subject's NUMBER value is identical with that of the predicate VP's NUMBER value. The two rules in (37) are both represented in (53).

lexical information

we have seen that the properties of a lexical head determine the components of the minimal phrase, in terms of complements, and that other properties of the head are directly properties of the phrase. This information is encoded in a lexical entry, for each word in the lexicon.

Every lexical entry at least includes phonological (but in practice, orthographic), morphological, syntactic, and semantic information.

(54) Minimal Lexical Information for *puts*:

a. phonological information: <puts>

b. syntactic information: verb, finite, 3rd singular

c. argument information: <agent$_i$, theme$_j$, location$_k$>

d. semantic information: *put*$'(i,j,k)$

The phonological information is the information about how the word is pronounced; the syntactic information indicates that this particular word is a verb and is in the 3rd singular present (finite) form. The argument structure represents the number of arguments which the verb selects, to indicate the participants that are minimally involved in the event expressed by the verb. This argument information is linked to its more precise meaning as indicated by the indexes i, j and k. These indexes refer to the participants denoted by the arguments. Finally, the semantic structure represents that the verb's meaning relates three participants – someone i who is doing the action of putting, something j being put in a place, and someplace k it is put in.

feature structure

Each feature structure is an attribute-value matrix (AVM):

(55)
$$\begin{bmatrix} \text{Attribute1} & \textit{value1} \\ \text{Attribute2} & \textit{value2} \\ \text{Attribute3} & \textit{value3} \\ \ldots & \ldots \end{bmatrix}$$

(56)
$$\begin{bmatrix} \text{Attribute1} & \textit{atomic} \\ \text{Attribute2} & \langle \quad \rangle \\ \text{Attribute3} & \{ \quad \} \\ \text{Attribute4} & [\ldots] \end{bmatrix}$$

Atomic

List (order matters)

Set (order doesn't matter)

Feature Structure (embedded)

typed feature structure

(57) a.

$$\begin{bmatrix} \textit{university} \\ \text{NAME } \textit{kyunghee univ.} \\ \text{LOCATION } \textit{seoul} \end{bmatrix}$$

b. * $\begin{bmatrix} \textit{university} \\ \text{NAME } \textit{kyunghee univ.} \\ \text{MAJOR } \textit{linguistics} \end{bmatrix}$

(58)

$$\begin{bmatrix} \textit{author} & & \\ \text{NAME} & \textit{kim} & \\ \text{SONS} & \langle \textit{Edward}, \textit{Richard} \rangle & \\ \text{HOBBIES} & \{\textit{swimming}, \textit{jogging}, \textit{reading}, \ldots\} & \\ \text{ADVANCED-DEGREE} & \begin{bmatrix} \text{FIELD } \textit{linguistics} \\ \text{AREA } \textit{syntax-semantics} \\ \text{YEAR } \textit{1996} \end{bmatrix} & \end{bmatrix}$$

structure sharing

(59)

$$\begin{bmatrix} \textit{individual} & \\ \text{NAME} & \textit{kim} \\ \text{TEL} & \boxed{1} \\ \text{SONS} & \left\langle \begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{richard} \\ \text{TEL } \boxed{1} \end{bmatrix}, \begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{edward} \\ \text{TEL } \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix}$$

One useful notion in the feature structure is structure-sharing, which we have already seen above in terms of the 1 notation (see (52)). This is to represent cases where two features (or attributes) have an identical value:

subsumption

The subsumption relation concerns the relationship between a feature structure with general information and one with more specific information. In such a case, the general one subsumes the specific one.

(60)

$$\text{A:}\ \begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{kim} \end{bmatrix} \sqsupseteq \text{B:}\ \begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{kim} \\ \text{TEL } \textit{961-0892} \end{bmatrix}$$

unification

Feature unification means that two compatible feature structures are unified, conveying more coherent and rich information.

(61) $\begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{kim} \end{bmatrix} \sqcup \begin{bmatrix} \textit{individual} \\ \text{TEL } \textit{961-0892} \end{bmatrix} \rightarrow$

$$\begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{kim} \\ \text{TEL } \textit{961-0892} \end{bmatrix}$$

incompatible unification

(62) $\begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{edward} \end{bmatrix} \sqcup \begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{richard} \end{bmatrix} \not\rightarrow$

$$* \begin{bmatrix} \textit{individual} \\ \text{NAME } \textit{edward} \\ \text{NAME } \textit{richard} \end{bmatrix}$$

if two feature structures have incompatible feature values, they cannot be unified:
Since the two smaller feature structures have different NAME values, they cannot be unified.

feature structure of a linguistic expression

(63)

$$\begin{bmatrix} \textit{verb} & \\ \text{PHON} & \langle \textit{puts} \rangle \\ \text{SYN} & \begin{bmatrix} \text{POS} & \textit{verb} \\ \text{VFORM} & \textit{fin} \end{bmatrix} \\ \text{ARG-ST} & \left\langle [\textit{agt}]_i, [\textit{th}]_j, [\textit{loc}]_k \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{PRED} & \textit{put-relation} \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{LOCATION} & k \end{bmatrix} \end{bmatrix}$$

This feature structure has roughly the same information as the informal representation in (54). The verb puts, like any verb, has its own phonological (PHON) value, syntactic (SYN), argument structure (ARG-ST), and semantic (SEM) information. The SYN attribute indicates that the POS (part of speech) value is verb, that it has a finite verbal inflectional form value (VFORM).The ARG-ST attribute indicates that the verb selects for three arguments (with thematic roles agent, theme, location), which will be realized as the subject and two complements in the full analysis. The SEM feature represents the information this verb denotes the predicate relation put-relation, whose three participants are linked to the elements in the ARG-ST via the indexing values i, j, and k.

argument structure

One thing to note here is that since there are some cases where we have difficulties in assigning a specific named semantic role to a selected argument discussed in Chapter 3, we typically just indicate the number of arguments each predicate is selecting in ARG-ST:

(64) a. $\left[\text{ARG-ST } \langle [\quad] \rangle\right]$ **Smile**

b. $\left[\text{ARG-ST } \langle [\quad], [\quad] \rangle\right]$ **Devour**

c. $\left[\text{ARG-ST } \langle [\quad], [\quad], [\quad] \rangle\right]$ **give**

One-place predicates like smile select for just one argument, two-place predicates like devour take two arguments, and three-place predicates take three arguments. Eventually, the arguments selected by each predicate are linked to grammatical functions, to the core semantic properties, and to other parts of the representation of the grammatical properties.

Argument structure and argument realization

Each element on the ARG-ST list is realized as SPR (specifier) or COMPS (complements):

(65) Argument Realization Constraint (ARC):
The first element on the ARG-ST list is realized as SPR, the rest as COMPS in syntax.

(66) a. John put the book in the box.
b. *John put in the box.
c. *In the box put John the book.
d. #The book put John in the box.

examples

(67)
$$\begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}, \boxed{3}\text{PP} \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2}, \boxed{3} \rangle \end{bmatrix}$$

(68)
$$* \begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{3}\text{PP} \rangle \\ \text{COMPS} & \langle \boxed{1}\text{NP}, \boxed{2}\text{NP} \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2}, \boxed{3} \rangle \end{bmatrix}$$

We see that the arguments selected by a lexical head should be all realized as SPR and COMPS, which are combined in the notion of VALENCE (VAL) features. (The term 'valence' refers to the number of arguments that a lexical item can combine with, to make a syntactically well-formed sentence, often along with a description of the categories of those constituents. It is inspired by the notion of valence as used in atomic theory in chemistry.)

This violates the ARC, which requires the first element of ARG-ST be realized as the SPR (the subject of a verb or the specifier of a noun).

different realizations

Notice that the arguments can be realized into different categories, depending on the properties of the given verb:

(69) a. The election results surprised everybody.

b. That he won the election surprised everybody.

(70) a.
$$\begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP} \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2} \rangle \end{bmatrix}$$

b.
$$\begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1}\text{CP} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP} \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2} \rangle \end{bmatrix}$$

Though there is no difference in terms of the number of arguments that 'surprise' selects, the arguments can be realized in a different phrase.

intransitives

(71) a. John disappeared.

b. *John disappeared Bill.

(72) a. John sneezed.

b. *John sneezed the money.

(73)
$$\begin{bmatrix} \langle \textit{disappear} \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle\ \ \rangle \\ \text{ARG-ST} & \langle \boxed{1} \rangle \end{bmatrix}$$

lexical elements in the classes V, A, N, and P, select one or more complement(s) to form a minimal phrase. With the construct of ARG-ST, we know that every lexical element has ARG-ST information which will be realized in surface form through the SPR and COMPS values. Verb types can be differentiated by looking only at the COMPS value since every verb will have one SPR (subject) element. This is exactly the way that verbs are differentiated using the traditional notion of subcategorization.

Intransitive: This is a type of verb that does not have any COMPS:
These verbs have no COMPS element—the list is necessarily empty. Such a verb will have just one argument that is realized as subject:

linking verbs

Verbs such as look, seem, remain, and feel require different complements that are typically of category AP:

(74) a. The president looked [weary].
b. The teacher became [tired of the students].
c. The lasagna tasted [scrumptious].
d. John remained [somewhat calm].
e. The jury seemed [ready to leave].

(75) a. John became a success.
b. John seemed a fool.
c. John remained a student.

Though each verb may select different types of phrases, they all at least select a predicative complement, where a property is ascribed to the subject.

(76)

$$\begin{bmatrix} \langle \textit{become} \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle\ \boxed{2}\text{XP}[\text{PRD } +] \rangle \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2} \rangle \end{bmatrix}$$

This kind of verb selects two arguments: one is canonically an NP to be realized as the subject and the other is any phrase (XP) that can function as a predicate (PRD +)

transitive

Unlike linking verbs, pure transitive verbs select a referential, non-predicative NP as their complement, functioning as direct object:

(77) a. John saw Fred.

b. Alice typed the letter.

c. Clinton supported the health care bill.

d. Raccoons destroyed the garden.

(78)
$$\begin{bmatrix} \langle \textit{destroy} \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP} \rangle \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2} \rangle \end{bmatrix}$$

ditransitive

There are also 'ditransitive' verbs that require IO and DO:

(79) a. The school board leader asked a question of the students.

b. The parents bought non-fiction novels for the children.

c. John taught English Syntax to new students.

(80)
$$\begin{bmatrix} \langle \textit{teach} \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle\ \boxed{2}\text{NP},\ \boxed{3}\text{PP} \rangle \\ \text{ARG-ST} & \langle \boxed{1},\ \boxed{2}[\textit{theme}],\ \boxed{3}[\textit{goal}] \rangle \end{bmatrix}$$

related constructions

(81)
$$\begin{bmatrix} \langle \textit{teach} \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle \boxed{3}\text{NP}, \boxed{2}\text{NP} \rangle \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2}[\textit{theme}], \boxed{3}[\textit{goal}] \rangle \end{bmatrix}$$

(82) a. The school board leader asked the students a question.

b. The parents bought the children non-fiction novels.

c. John taught new students English Syntax.

complex transitive

There is another type of transitive verb which selects two complements, one functioning as a direct object and the other as a predicative phrase (NP, AP, or VP), describing the object:

(83) a. John regards Bill as a good friend.

b. The sexual revolution makes some people uncomfortable.

c. Ad agencies call young people Generation X-ers.

d. Historians believe FDR to be our most effective president.

(84)
$$\begin{bmatrix} \langle \textit{call} \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}, \boxed{3}\text{XP} \rangle \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2}, \boxed{3}[\text{PRD } +] \rangle \end{bmatrix}$$

other types

Even though these five types of verb that we have seen so far represent many English verb types, there are other verbs that do not fit into these classes; for instance, the use of the verb 'carry'

(85) a. *John carried to the door.

b. *John carried her.

c. John carried her on his back.

(86)

$$\begin{bmatrix} \langle carry \rangle & \\ \text{SPR} & \langle \boxed{1}\text{NP} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}, \boxed{3}\text{PP} \rangle \\ \text{ARG-ST} & \langle \boxed{1}[agt], \boxed{2}[th], \boxed{3}[loc] \rangle \end{bmatrix}$$